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Myocardial Infarction on a 17-year-old Diabetic Adolescent

Four to six per cent of all deaths under the age of 40 years occur in patients with diabetes mellitus.¹ Although this figure may appear small, the circumstances of such deaths are not always clear. A 17-year-old boy, found dead, with evidence of acute myocardial infarction is reported. We gratefully acknowledge the parents' permission for doing this.

The patient was born on 9 November 1978. He was the second child, born to healthy parents. Our patient's history was unremarkable until December 1985 when he developed Type 1 diabetes mellitus. Following a brief 'honeymoon' period he was treated with two daily injections of insulin, until 1993, when he was changed to three premeal injections of soluble insulin (human Actrapid Penfill) and one of Ultratard (20 units) before bedtime. His recent dosage was Actrapid 12 units before breakfast, 10 units before lunch, and 8 units before supper. He was on a 2500 kcal nutritional regimen (divided approximately into 500, 1000, and 1000 kcal for breakfast, lunch and supper) and exercised moderately.

He was last seen in our Centre on 18 January 1996. He was 17 years old and had had Type 1 diabetes for 10 years. His height was 176 cm, he weighed 59 kg, and BP was 110/70 mmHg. Physical examination was unremarkable. Laboratory work-up included HbA_{1c} 6.8%, microalbuminuria of 18.2 µg min⁻¹, GFR 138 ml min⁻¹, renin 1.25 ng l⁻¹, T4 91.4 nmol l⁻¹, TSH 4.4, serum creatinine 77.5 µmol l⁻¹, serum cholesterol 5.3 mmol l⁻¹, triglycerides 63 mg dl⁻¹, HDL-C 2 mmol l⁻¹, LDL-C 2.97 mmol l⁻¹, Apo A1 194, B 69.8, Lp(a) < 10.3.

On 15 March 1996 he went to bed with a blood glucose of 8.9 mmol l⁻¹ 4 hours following the last injection of fast acting insulin and supper. He had not exercised on that day, consumed about 75 g rice as an evening snack, and did not receive any other medication. He did not seem to be restless during sleep. Nonetheless, he was found dead in bed at 7 am. The autopsy showed congested lungs. The heart weighed 320 g. The coronary vessels were slightly atheromatous. An ischaemic region was noticed in the rear myocardial wall and the left ventricle, with a recent haemorrhagic infiltration. The myocardium was brittle and soft. No other organ lesions were reported. The medical examiner's report attributed the death to a recent acute myocardial infarction.

Interest in unexpected and unexplained deaths in young patients with diabetes mellitus was raised following a report by Tattersall and Gill² of the so-called 'dead-in-bed syndrome'. They reported 22 deaths on apparently good health diabetic patients. The cause of death was not established. Four similar deaths occurred in Bergen, Norway, during the years 1988–1990.³ On the basis of these observations a nationwide retrospective investigation was conducted by the same authors.¹ Autopsies performed on 13 of their cases did not reveal any cause of death. Twelve patients, however, were reported as having had frequent episodes of hypoglycaemia. The authors postulated that introduction of human insulin and multiple daily injections may be impli-

cated in hypoglycaemic attacks, when right control is applied.

Although, hypoglycaemia could be considered in our patient, this seems unlikely, as he had not exercised that day, his blood glucose was slightly elevated (8.9 mmol l⁻¹), he had his supper, and the action of the fast acting insulin should have been fading. Moreover, the autopsy findings were confirmatory of acute myocardial infarction.

It is our belief that diabetologists of children and adolescents should be prepared to face unexplained deaths. Whether young patients with Type 1 diabetes should have a periodic cardiovascular evaluation remains debatable. There is evidence, however, of early cardiovascular lesions in childhood Type 1 diabetes, shown by others and recently by our group.^{4,5}

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